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U. S. Department of Agriculture

GRADES AND QUALITIES OF FOOD

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For a number of years producers, wholesalers, and others dealing in large quantities of foods have had standards for grades of the principal agricultural products. Such standards have provided a definite basis for trading. Many of the standards have been developed by the Federal Government, some by local authorities, and still others by the various industries. Now, in answer to a growing demand from consumers, more and more food products labeled by grades are appearing in the retail markets. Although some progress is being made in providing grades for consumer goods, the larger part of the food in most retail outlets is still ungraded. As price cannot be used as a dependable index of quality, grade names are especially useful for packaged foods where there is no opportunity to inspect the product until after the purchase.

The following paragraphs summarize briefly for different groups of foods what several agencies are doing to bring information on grades to the consumer. More detailed information may be obtained from the publications listed on the last pages.

Many of the standards for foods that are now in use have been set up by the Department of Agriculture. These are of three types: "mandatory", "permissive", and "tentative." A mandatory standard is one which must be used in accordance with the conditions specified by the law under which the standard is promulgated. A permissive standard is one recommended for optional use. A tentative standard is one offered for commercial use to test its practicability or as a basis for discussion. A tentative standard may later become a permissive or a mandatory standard. Any of the standards may be revised from time to time as conditions change.

Dairy Products

Butter. Under the provisions of the Farm Products Inspection Law, the United States Department of Agriculture maintains a service for the grading of butter (28). ^{1/} Butter is commercially classified under several headings as Dairy butter, which is made on a farm; Creamery butter, made in a creamery or factory; Packing-stock butter; Ladled butter; Process or Renovated butter; and Grease butter.

^{1/} Numbers in parentheses refer to Literature Cited, pages 10, 11, 12

In grading the first three classes of butter, the quality is indicated by a score which gives maximum ratings to the various factors as follows: Flavor, 45; body, 25; color, 15; salt, 10; package, 5; total, 100. Butter scoring above 93 or 94 shall be fine, sweet, fresh, mild, and clean in flavor. Diminishing desirability is expressed by lowered scores. Any butter scoring below 75 is classified as Grease butter and as such is considered unfit for food.

Regardless of the score given to butter on the above scale of rating, any butter falling below the 80-percent legal minimum for butter fat is an adulterated product under the terms of the Federal Food and Drugs Act.

A dated "certificate of quality" issued by authority of the United States Department of Agriculture may accompany butter with an official score of 92 or more. Under proper methods of distribution, which include adequate refrigeration, certified butter should reach the consumer in first class condition within 2 weeks of the date of grading which appears on the certificate. Millions of pounds of certified butter are sold annually in retail stores, as a number of firms use the United States Government grading service.

Cheese (9). A small amount of cheese is graded commercially by Federal inspection, but at the present time (April 1937) these grades do not appear on the cheese sold in retail stores. Cheese labeled with a State grade is sometimes available for consumers.

Milk and cream. Methods of milk grading and the standards established for grades of milk differ in different localities. However, several hundred cities and towns have adopted a milk ordinance and code which is approved by the United States Public Health Service and the Bureau of Dairy Industry of the United States Department of Agriculture (29).

The grades defined by the milk ordinance are certified milk; grades A, B, C, and D raw milk; and grades A, B, and C pasteurized milk. Grade D raw milk and Grade C pasteurized milk shall be plainly labeled "cooking only." Milk prices vary with the grade. Points to consider in selecting milk are given in some detail in Farmers' Bulletin 1705 (2).

Milk is also on the market in evaporated and dried forms, both of which are frequently less expensive than the equivalent quantity of fresh milk. Evaporated milk is usually sold in "tall" cans containing $14\frac{1}{2}$ ounces, and in "baby size" cans containing 6 ounces. Seventeen ounces of evaporated milk contain about the same quantity of solids as a quart of whole milk, but, because evaporated milk has been heated, its vitamin content is somewhat lower than that of the fresh milk from which it is made. It is a good source of vitamins A and G, but like other milk it needs to be supplemented by foods rich in vitamins B, C, and D.

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Dried skim milk (1), which at the present time is used largely by the baking, ice cream, and candy industries, has been graded by the American Dry Milk Institute as Extra, Standard, and Third grade. Dried skim milk may, in some communities, be obtained from bakeries, or ice cream manufacturers, but as yet it is not generally distributed through retail stores.

Cream must contain 18 percent or more of milk fat. Several classes of cream are recognized. For example, "whipping cream", as defined by the United States Department of Agriculture (27), must contain not less than 30 percent of milk fat. Compulsory cream-grading laws are in effect in 10 States: California, Idaho, Iowa, Minnesota, Mississippi, Oklahoma, Oregon, Texas, Utah, and Washington. The cream grades differ somewhat in the different states.

Eggs

In some retail markets eggs are sold in sealed cartons bearing on the seal the date of grading and the inscription U. S. Specials or U. S. Extras and, if desired, the additional grade terms Retail Grade AA and Retail Grade A, respectively. Any of these inscriptions on the dated seal indicate that, on the date specified, the eggs were examined by a Federal egg grader, who noted the size of the eggs, the condition of the shell, and, by candling, the size of the air cell and the condition of the yolk and white (15).

First quality, or U. S. Special eggs, must have clean, sound shells and regular, localized air cells not more than one-eighth of an inch in depth. The whites must be firm and clear, the yolks must be well-centered with outline indistinct, and there must be no visible development of the germ. U. S. Extras, usually the best quality of eggs available, must meet similar requirements, except that the air cell may be two-eighths of an inch in depth, the yolk must be fairly well-centered, and its outline may be moderately defined. Only these two highest grades may be retailed under a "certificate of quality."

U. S. Standards may be sold under dated seals, which indicate that the eggs have been officially graded. These seals must also show the designation Retail Grade B. It is important to note the date on the seal or certificate of quality, as under unfavorable holding conditions the quality of eggs may deteriorate rapidly after grading.

Eggs are also graded for size. In any quality, eggs may be large, having a minimum weight of 24 ounces a dozen; medium-sized, weighing at least $20\frac{1}{2}$ ounces a dozen; or small, weighing at least 17 ounces a dozen. Besides the United States grades for eggs, many states have their own official grades.

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Fruits and Vegetables

Fresh Fruits and Vegetables. Standards for grades for many fresh fruits and vegetables have been established by the United States Department of Agriculture. Such grades are optional and are used mostly in the larger commercial transactions. Among the quality factors considered in the grading are degree of ripeness, uniformity of size and shape, color, and freedom from injuries caused by such things as mold, decay, freezing, sunburn, cuts, cracks or broken skin, bruises, worms, insects or plant diseases.

The grade terms and the number of grades established differ for different products. For some fruits and vegetables, U. S. Fancy is the highest grade, with U. S. No. 1 as the next grade. The use of U. S. Fancy indicates a product of exceptionally fine quality. For most fresh fruits and vegetables, U. S. No. 1 is the highest grade, and in all cases is intended to include the major portion of the commodity that has customarily met the standards of the best commercial grade (17).

Onions and potatoes in packages of 25 pounds or less, and marked with the grade, are sometimes found in the retail markets. Many fruits and vegetables, notably berries and greens, are so perishable that their degree of desirability changes rapidly. It is not feasible for the retailer to offer such products by grade. The Department of Agriculture has issued a buying guide for consumers (10), which gives points to be considered in the selection of specified fruits and vegetables.

Citrus fruits are graded for size, according to the numbers in crates or boxes of specified size. Orange sizes run from the very large 80 to the small size 324. Grapefruit sizes range from 28 to 126; lemons, from 240 to 490; tangerines, from 48 to 216. Oranges that pack 176 to 200 per box and tangerines that pack 144 to 168 or 196 are good sizes for average use. Citrus fruits heavy for their size are usually thin skinned and contain more juice than those that have a coarse skin or are puffy or spongy (10).

Canned fruits and vegetables. Since 1930, when the McNary-Mapes amendment to the Food and Drugs Act was passed, the Secretary of Agriculture has had the power to establish a minimum standard of quality for each kind of canned food, except meat and milk. To April 1937, minimum standards (26) have been established for the following canned foods: Peaches, pears, peas, dry peas, tomatoes, apricots, and cherries. Any canned food which does not measure up to the requirements of an established standard must have a specified box legend conspicuously printed on its label. The first line of the legend reads, "Below U. S. Standard." Following this is an explanatory statement to assure consumers that substandard products are still wholesome foods, though of low quality or grade. On fruits this supplementary statement reads, "Good Food - Not High Grade"; on vegetables, "Low Quality But Not Illegal."

Slack filled canned foods, whether because of excessive headspace or packing medium, must be labeled "Below U. S. Standard - Slack Fill." When such is the case, the expression "Contains Excess Added Liquid" must also be added. This requirement applies even to food for which no quality standards have as yet been issued.

Besides the mandatory minimum standards for canned foods just mentioned, standardized grades have been developed for optional use by the Bureau of Agricultural Economics. Under the authority of the Farm Products Inspection Law, the Secretary of Agriculture has promulgated permissive standards for canned corn (both whole-grain and cream style), peas, snap beans, tomatoes, and canned grapefruit. Tentative standards have been prepared for many other canned fruits and vegetables. These standards have been drawn up to recognize several quality grades. The top grade is designated U. S. Grade A (Fancy), and must represent the most desirable part of the crop for canning, which has been carefully selected for uniformity of size, color, and appearance. The other grades in order of quality are called U. S. Grade B (Extra Standard or Choice), U. S. Grade C (Standard), and Offgrade (Substandard). These grades are uniform from year to year, regardless of crop conditions. Grades B and C are wholesome products which may frequently serve the housewife's purpose as well as a higher grade. A large percentage of all canned foods falls into Grade C. "The raw products used in this grade may not be so carefully selected as to size, color, and maturity as in the higher grades. Products of this grade should sell at cheaper prices than products of the higher grades " (30).

The use of grade terms on canned goods is increasing. Many millions of cans of fruit and vegetables labeled "Grade A", "Grade B", or "Grade C" are sold each year in retail stores. A number of canners and large distributors are voluntarily using these Bureau of Agricultural Economics grades. "If goods are not of the grade claimed, the goods are subject to seizure for misbranding under the United States Food and Drugs Act" (30).

Dried Fruits. Dried apples, apricots, peaches, and pears are commercially classified into five grades in which size and quality are both considered, as Extra Fancy, which contains the largest, most uniform, and best fruits, Fancy, Extra Choice, Choice, and Standard. Figs are graded as Fancy, Choice, and Standard. Stemmed muscat raisins are graded for size and are referred to as Four -, Three -, Two -, or One-crown. The Four-Crown is the largest size. Cluster raisins are also graded, the largest being the Six-Crown or Imperial Clusters, the smallest, the Three-Crown Layers (4). Prunes are graded according to the number required to make a pound, and are referred to as 20 - 30's, 30 - 40's, and so forth, down to the very small 110 - 120's. The smaller sizes of dried fruits are less expensive and for many purposes are as good as the larger sizes.

Dried Beans and Peas. The Department of Agriculture standards for the commercial grading of dried beans defines 20 classes of beans (14). Within each class are four grades: U. S. No. 1, U. S. No. 2, U. S. No. 3, and U. S. Sample grade. U. S. No. 1 must be "well screened and of good natural color"; U. S. No. 2 are "well screened and may be slightly off color"; U. S. No. 3 "may be of a poor color." For each class and grade, there are specified "maximum limits of splits, damage, other classes, and foreign material." While these grades are used mostly for commercial transactions, they are sometimes used in retail outlets.

Soybeans are classified as yellow, green, brown, black or mixed, and within each class are separated into five U. S. Grades, Nos. 1, 2, 3, 4, and Sample Grade (16).

Official standards for dried peas (18) provide for a classification by variety. The five grades are as follows: U. S. Extra No. 1, U. S. No. 1, U. S. No. 2, U. S. No. 3, and U. S. Sample Grade. The size requirements depend upon the variety. Tentative standards for split peas classify them as green or yellow. In each class are four grades having the same names as those for dried beans (24).

Honey

Extracted honey may be sold under the grades United States Fancy and United States No. 1. These terms seldom appear on small cans or bottles of honey, but are sometimes used on the wooden cases in which the honey is packed, or on the 5- or 10-pound pails or jars of honey. Individually wrapped sections of comb honey are sometimes labeled as to grade (25). The color of the honey is also mentioned on the grade stamp.

Meats, Poultry, and Fish

Meats intended for interstate or foreign commerce are inspected by representatives of the Bureau of Animal Industry of the United States Department of Agriculture. Inspection includes veterinary examination of carcasses and organs at time of slaughter, and rigid sanitary requirements must be met. Fresh meats that pass inspection are marked with a circular purple stamp containing the inscription "U. S. Insp'd & P's'd." Cured, canned, and packaged products containing meats and prepared under Federal inspection are also appropriately labeled to show that the meat came from healthy animals. A few States and numerous cities conduct inspection of meats within their jurisdiction.

In addition to this required inspection, meats may be classified and graded for quality according to a system worked out by the Bureau of Agricultural Economics. Most of the meat is graded in carcass form, and the points considered are conformation, finish, and quality. When wholesale cuts are graded, consideration may also be given to color, texture, grain, marbling, and the relative proportions of flesh, fat, and bone (8).

Graded meats are stamped (5,21) by or under the supervision of a Federal official. The class and grade of the meat is printed on the carcass by a roller stamp in such a way that the information shows on all the major retail cuts. This grade marking, at a little distance, appears like a purple band across the meat. The circular inspection stamp which guarantees the wholesomeness of the product should not be mistaken for a grade stamp. The ink used for these stamps is a harmless vegetable compound, which usually disappears when the meat is cooked.

Graded meats are available in some stores in a number of large cities. For the most part this grading is voluntary, but in Seattle, Washington, it has been made compulsory by city ordinance. The quality of any given grade is uniform throughout the country and does not change from season to season.

Beef, veal, and lamb. Government graded beef (8) is divided into five classes: Steer, heifer, cow, bull, and stag. The first two classes are subdivided into grades as follows: Prime, or No. 1; Choice, or No. 2; Good, or No. 3; Medium, or No. 4; Plain, or No. 5; Cutter, or No. 6. Cow, bull, and stag beef is never graded as Prime. Only a small percentage of carcasses can pass the high standards for Prime beef. Most beef falls into the medium grade. The five highest grades of lamb, mutton (6), veal, and calf (7) carcasses have the same grade names as the corresponding beef grades. The lowest grade is called Cull or No. 5.

Pork. Tentative grade descriptions have been prepared for pork carcasses and cuts. These grades are being used in specifications by many Federal, State, and city institutions with satisfactory results.

Sausage and Prepared Meats. Sausage and prepared meats are also Government graded in several large cities. The grade is shown on tags or stickers on the product, or on the containers (19).

Rabbits. Tentative United States standards for dressed domestic rabbits (12) classify them as young (which includes broilers, fryers, and roasters) and old. The grades within each class are: U. S. Prime, U. S. Choice, and U. S. Commercial.

Poultry. The Bureau of Agriculture Economics has drawn up tentative U. S. Standards for dressed turkeys (23), and for chickens and fowls (13).

Turkeys are classified by age and sex into young or old hens, and young or old toms. Within each classification are four grades: U. S. Special, or U. S. Grade AA; U. S. Prime, or U. S. Grade A; U. S. Choice, or U. S. Grade B; and U. S. Commercial, or U. S. Grade C. In some markets, turkeys are individually tagged with the United States grades; in other places, although the birds may have been commercially graded, they are not tagged for the retail trade.

Chickens and fowls are first classified by age. The young birds are further classified as broilers, fryers, roasters, stags, and capons. Old birds, which may be any age or weight, are classed as cocks or fowls. These older birds are often advertised as "stewing chickens."

Within each class the four grades bear the same names as the turkey grades. Chickens rarely are found in the retail markets individually tagged, although they are often shipped in boxes stamped with the United States grade names.

Fish. No authority has as yet been granted by Congress for the Federal grading of fish. However, in several States, including Minnesota and Virginia, some fish grading has been done.

In 1934 Congress passed the seafood inspection amendment (Sec. 10 A) to the Federal Food and Drugs Act, which provides for continuous Federal supervision of canning operations, and for a distinctive labeling on the products so supervised. The inspection service is not mandatory but is furnished on request of the packer. To April 1937, only the shrimp-canning industry had availed itself of the Federal supervision. The canned-shrimp labels bear the legend "Production supervised by the U. S. Food and Drug Administration."

Pickles and Olives

The National Pickle Packer's Association (3) has established standards for pickles based on shape, curing, color, and size. Variations in size are from $1\frac{1}{2}$ to 4 or more inches in length and the names used for the different sizes are "midgets", "gherkins", "smalls", "medium", and "large." Green olives are graded for size according to the number per kilo (2.2 pounds). The largest queen olives run 60 - 70 to a kilo; the very small 200 - 220 a kilo. The manzanillo olives used for stuffing are graded from the large 180 - 200, to the very small 340-360 per kilo.

Since 1931 State inspection of ripe olives has been required in California. Canned products falling below a minimum standard must be marked "seconds." All labels must carry a cut showing the size of the fruit and a statement of the approximate number of olives in the container.

Rice

The rice most usually sold in the retail stores is milled rice, or rice from which the hulls, germs, and bran layers have been removed. Eleven classes (or varieties) and several subclasses are recognized commercially. United States standards separate each variety into five U. S. grades as extra Fancy (U. S. No. 1), Fancy (U. S. No. 2), Extra Choice (U. S. No. 3), Choice (U. S. No. 4), Medium (U. S. No. 5), and Sample grade (20).

Brown rice, or rice from which hulls only have been removed, is also available. Eight varieties and several subclasses are recognized. Brown rice may be graded as Extra Fancy, Fancy, and Choice (22).

Rice in 100-pound bags is frequently labeled as to variety and grade. When sold in the smaller retail packages the grade is seldom given and the varieties are frequently mixed. As the different varieties of rice have different cooking properties it is important that varieties should not be mixed (11).

Definitions and Standards for Food Products

The Food and Drug Administration has set up definitions and standards (27) of identity for many important food products. While not quality standards, they do in many instances assure the consumer of at least a minimum quality.

Food Containers

A simplified practice recommendation of the National Bureau of Standards recognizes 27 standard sizes of cans for fruit and vegetables. However, many can sizes not recommended are in use. Can sizes most frequently used for fruits and vegetables are shown in table 1. Meat and fish products are packed in tins of many sizes and shapes.

Table 1. - Commonly used sizes of standard cans for fruits and vegetables

Can size	Approximate net weight	Contents		Approximate servings
		Cupfuls	Number	
8 Z tall, or buffet	8 ounces	1	1½	
No. 1 eastern, or picnic	11 ounces	1 1/3	2	
No. 1 tall	16 ounces	2	3 - 4	
No. 2	20 ounces	2 1/2	4 - 5	
No. 2½	28 ounces	3 1/2	5 - 7	
No. 3	33 ounces	4	6 - 8	
No. 10	6 pounds 10 oz.	13	20 - 26	

The most commonly used can for fruits is No. 2 1/2 and for vegetables No. 2. Larger and smaller cans are available to suit the needs of any group. For large families, one large can is generally a more economical purchase than several small ones.

Several sizes of cans used less frequently than those listed in table 1 sometimes appear in the retail stores. These cans look much alike and may be distinguished one from another only by a close comparison of height, diameter, and net weight of contents. For example, can No. 300 is 4 7/16 inches high and 3 inches in diameter. Can No. 303 is 1/16 of an inch shorter, but 3/16 of an inch greater in diameter than can No. 300, and its contents usually weigh from 1 to 2 ounces more. Unless care is taken to read the contents on the label either of these cans may be mistaken for the No. 2 can, which holds from 4 1/2 to 5 1/2 ounces more than the No. 300 can, and from 3 to 4 ounces more than the No. 303 can.

Simplified practice recommendations have also reduced the number of sizes of containers in common use for mayonnaise, preserves, jelly, apple butter, cottage cheese, and sour cream.

Standard sizes have also been made compulsory for barrels and different varieties of baskets and hampers used for fruits and vegetables. This eliminates the large number of unnecessary sizes which were confusing to the consumer.

An amendment to the Food and Drugs Act provides that all packaged foods shipped in interstate commerce shall be conspicuously marked on the outside of the package in terms of weight, measure, or count.

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